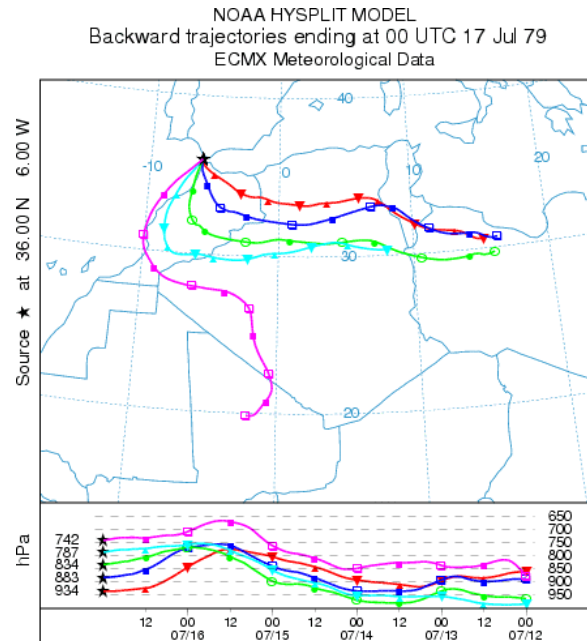


## Source Attribution via Back Trajectories

Frequently it is necessary to attribute a pollutant measurement to a specific source location. One approach is to compute a backward trajectory to determine the air's origin. Although it is not uncommon to see sources identified by a single trajectory, the uncertainties inherent in a single-trajectory can preempt its utility. One way to reduce those uncertainties would be to compute multiple trajectories, in height, time, and space. For instance if we use the previous example of dust observations (from TOMS) over southern Spain on July 17<sup>th</sup> as a starting point, a backward trajectory calculation for [multiple heights](#) clearly shows transport at all levels from North Africa.



Quickly changing meteorological conditions also contribute to uncertainty, especially if a pollutant sample represents an average rather than a snapshot concentration. Set the height (1500 m) and from the [advanced menu](#) set the restart interval to 6 hours. Over the 5-day period, most of the trajectories originated in North Africa. Closer examination of the [trajectory output file](#) would determine when the temporal shift occurred. The third variation is to examine the spatial sensitivity. In this simulation, set four additional [starting points](#), offset by 1 degree from the central location. The result shows a division in the flow properties, slower to the west and faster transport to the east.

